

This publication, *Twenty Questions and Answers About the Ozone Layer: 2014 Update*, is a component of the 2014 report of the Montreal Protocol Scientific Assessment Panel, *Scientific Assessment of Ozone Depletion: 2014*. This document is an update of *Twenty Questions and Answers About the Ozone Layer: 2010* (Fahey, D.W., and M.I. Hegglin) and reflects the scientific information presented in the 2014 Assessment Report. It is a continuation of the updates of the first document with this title scope: *Twenty Questions and Answers About the Ozone Layer: 2002* (Fahey, D.W.).

Lead Author

Michaela I. Hegglin

University of Reading, UK

Coauthors

David W. Fahey

NOAA ESRL Chemical Sciences Division, USA

Mack McFarland

Dupont Chemicals & Fluoroproducts, USA

Stephen A. Montzka

NOAA ESRL Global Monitoring Division, USA

Eric R. Nash

NASA Goddard Space Flight Center, USA

Contributors

Pablo O. Canziani

Pontificia Universidad Católica – CONICET, Argentina

Lucy J. Carpenter

University of York, UK

John S. Daniel

NOAA ESRL Chemical Sciences Division, USA

Nada Derek

Commonwealth Scientific and Industrial Research Organisation, Australia

Vitali E. Fioletov

Environment Canada, Canada

Peter von der Gathen

Alfred Wegener Institute, Germany

Bradley D. Hall

NOAA ESRL Global Monitoring Division, USA

Bryan Johnson

NOAA ESRL Global Monitoring Division, USA

Kathy Lantz

NOAA ESRL Global Monitoring Division / CIRES, USA

Zachary Lawrence

New Mexico Institute of Mining and Technology, USA

Gloria L. Manney

NWRA / New Mexico Institute of Mining and Technology, USA

Olaf Morgenstern

National Institute of Water and Atmospheric Research, New Zealand

Paul A. Newman

NASA Goddard Space Flight Center, USA

Stefan Reimann

Swiss Federal Laboratories for Materials Science and Technology, Switzerland

Matthew Rigby

University of Bristol, UK

Michelle L. Santee

Jet Propulsion Laboratory, California Institute of Technology, USA

Guus J.M. Velders

RIVM (National Institute for Public Health and the Environment), The Netherlands

Darryn W. Waugh

Johns Hopkins University, USA

Mark Weber

University of Bremen, Germany

The authors would like to acknowledge in addition the many contributors to previous versions of this document.

Reviewers

*Special Recognition***Malcolm K.W. Ko**

NASA Langley Research Center, USA

Michelle L. Santee

Jet Propulsion Laboratory, California Institute of Technology, USA

Ross J. Salawitch

University of Maryland, USA

Rajendra Shende

TERRE Policy Centre, India

Theodore G. Shepherd

University of Reading, UK

Donald J. Wuebbles

University of Illinois, USA

In addition, this document was discussed by other scientists who attended the Panel Review Meeting for the 2014 Assessment report in Les Diablerets in June 2014:

Ayité-Lô Ajavon

North-South Environment, Togo

Stephen O. Andersen

Institute for Governance & Sustainable Development, USA

Julie M. Arblaster

Australian Bureau of Meteorology, Australia

Pieter Aucamp

Ptersa, South Africa

Gufran Beig

Indian Institute of Tropical Meteorology, India

Geir O. Braathen

World Meteorological Organization, Switzerland

John P. Burrows

University of Bremen, Germany

Martyr P. Chipperfield

University of Leeds, UK

Martin Dameris

DLR, Institut für Physik der Atmosphäre, Germany

Christine A. Ennis

CIRES / NOAA ESRL Chemical Sciences Division, USA

Lucien Froidevaux

Jet Propulsion Laboratory, California Institute of Technology, USA

Nathan P. Gillett

Environment Canada, Canada

Sophie Godin-Beckmann

Centre National de la Recherche Scientifique, France

Marco Gonzalez

Sistemas de Energía, Costa Rica

Neil R.P. Harris

University of Cambridge, UK

Kenneth W. Jucks

NASA Headquarters, USA

David J. Karoly

Melbourne University, Australia

Lambert J.M. Kuijpers

Technical University Eindhoven, Netherlands

Michael J. Kurylo

Universities Space Research Association / Goddard Earth Sciences, Technology, and Research, USA

Ulrike Langematz

Freie Universität Berlin, Germany

Martin R. Manning

New Zealand Climate Change Research Institute, New Zealand

Amanda C. Maycock

University of Cambridge, UK

Pauline Midgley

University of Bern, Switzerland

Rolf Müller

Forschungszentrum Jülich, Germany

Hiroaki Naoe

Japan Meteorological Agency, Japan

Steven Pawson

NASA Goddard Space Flight Center, USA

Thomas Peter

ETH Zurich, Switzerland

David Plummer

Environment Canada, Canada

Lorenzo Polvani

Columbia University, USA

Ronald G. Prinn

Massachusetts Institute of Technology, USA

John A. Pyle

National Centre for Atmospheric Science, UK and University of Cambridge

A.R. Ravishankara

Colorado State University / NOAA ESRL Chemical Sciences Division, USA

Jose M. Rodriguez

NASA Goddard Space Flight Center, USA

Megumi Seki

UNEP Ozone Secretariat, Kenya

Susan Solomon

Massachusetts Institute of Technology, USA

Wolfgang Steinbrecht

Deutscher Wetterdienst Hohenpeissenberg, Germany

William T. Sturges

University of East Anglia, UK

David W.J. Thompson

Colorado State University, USA

Timothy J. Wallington

Ford Motor Company, USA

Ray F. Weiss

University of California San Diego / Scripps, USA

Shigeo Yoden

Kyoto University, Japan

Lingxi Zhou

Chinese Meteorological Administration, China

Coordinating Editor

Christine A. Ennis

CIRES / NOAA ESRL Chemical Sciences Division, USA

Technical Management Assistance

Debra A. Dailey-Fisher

NOAA ESRL Chemical Sciences Division, USA

Graphic Art Design

Dennis Dickerson

Respond Grafiks, USA

Publication Layout and Design

Nayna Morjaria

Design & Print Studio, University of Reading, UK

World Meteorological Organization

7bis, avenue de la Paix
Case postale 2300
CH-1211, Geneva 2
Switzerland

United Nations Environment Programme

Ozone Secretariat
P.O. Box 30552
Nairobi, 00100
Kenya

U.S. Department of Commerce

National Oceanic and Atmospheric Administration
14th Street and Constitution Avenue NW
Herbert C. Hoover Building, Room 5128
Washington, D.C. 20230

National Aeronautics and Space Administration

Earth Science Division
NASA Headquarters
300 E Street SW
Washington, D.C. 20546-0001
European Commission

Directorate-General for Research and Innovation

B-1049 Bruxelles
Belgium
Published January 2015

ISBN: 978-9966-076-02-1

The Scientific Ozone Assessment report including the Twenty Questions and Answers is available electronically via the following links:

http://www.wmo.int/pages/prog/arep/gaw/ozone_2014/ozone_asst_report.html
http://ozone.unep.org/en/assessment_panels_bodies.php?committee_id=7
<http://esrl.noaa.gov/csd/assessments/ozone/>

Note: Figures from this report are in the public domain and may be used with proper attribution to source.

Citation information

Michaela I. Hegglin (Lead Author), David. W. Fahey, Mack McFarland, Stephen A. Montzka, and Eric R. Nash, *Twenty Questions and Answers About the Ozone Layer: 2014 Update, Scientific Assessment of Ozone Depletion: 2014*, 84 pp., World Meteorological Organization, Geneva, Switzerland, 2015.

Sponsors

We are grateful to the UNEP Ozone Secretariat, the National Oceanic and Atmospheric Administration, the European StratoClim Project, the University of Cambridge through funding from the Department for the Environment, Food, and Rural Affairs (Defra), and the University of Reading for providing funding for the layout, print, and design of the *Twenty Questions and Answers About the Ozone Layer: 2014*.



**University of
Reading**